Challenges for Sustainable Mobility

Toyota Business Strategy Meeting 2007
Challenges to Deliver Mobility for a Sustainable Society

- Development of appealing products
- CO2 reduction
- Effective utilization of alternative fuels
- Cleaner emissions
- Safety
Diesel Engine Lineup

Wide array of diesel engines and increased production

- 1.4 litre
- 1.6 litre class
- 2.0-2.2 litre
- 2.5-3.0 litre
- V8 4.5 litre

CO₂ Reduction
Cleaner Emissions

To be introduced

Reached 1 million vehicles per year

Million Units

Diesel Engine Production Volume

Wide array of diesel engines and increased production
Advanced Clean Diesel Technology

Advantage
- Fuel economy improvement
- Low emission
- High output
- Low noise

Toyota D-CAT System
- Low Compression Ratio
  - Ceramic Glow Plug
- Common Rail System
  - Piezo Injector
- High Pressure Injection
  - 180MPa~
- Variable Nozzle Turbo Charger
- DPNR (Diesel Particulate - NOx Reduction System)

Early introduction of advanced diesel engine
Clean Emission Technology

**History of Toyota’s after-treatment technology**

- 1992 NSR: application for patent

- 1994 Start production of NSR catalyst for gasoline engine

- 2003 Start production of DPNR catalyst for diesel engine

We have been offering licensing of NSR to multiple car manufacturers, and this seems likely to continue.

**Cleaner emissions by introduction of new engine**

We have been offering licensing of NSR to multiple car manufacturers, and this seems likely to continue.

**NSR**: NOx Storage Reduction Catalyst

**DPNR**: Diesel Particulate – NOx Reduction System

Promotion of emissions treatment (original technology and production)
Environmental Superiority of Hybrid Vehicles

CO2 Reduction

HV contributes to CO2 reduction

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Annual Sales Volume of Hybrid Vehicles

![Graph showing annual sales volume of hybrid vehicles from 1997 to 2007, with projections for 201X. Key points include:

- Cumulative sales of 1 million worldwide
- Cost reduction, Downsizing, Battery development
- Further evolution of HV and plan of expansion to more models

(1000 units/year)

1000
900
800
700
600
500
400
300
200
100


1 million vehicles per year

CO₂ Reduction

Further evolution of HV and plan of expansion to more models

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Efforts to Utilize Alternative Fuels

**Bio-fuel**
- Flex Fuel Vehicle
- Advanced bio research
- Quality improvement of conventional bio-fuel

**Hydrogen**
- Fuel Cell Hybrid Vehicle

**Electric**
- Plug-in Hybrid Vehicle

**CO₂ Reduction**
Promotion of alternative fuels
Plug-in Hybrid Vehicle

Charge battery externally, and expand EV driving range

- PHV runs by motor charged by electricity for short range
- PHV runs by engine and motor for longer distances, high speed, and hill-climbing

A practical way to use electricity
Superiority of Toyota PHV

Charge battery externally and expand EV driving range

**CO₂ Reduction**
Promotion of alternative fuels

**EV-based PHV**
- Electric flow
- Traction flow

**HV-based PHV (Toyota PHV)**
- Electric flow
- Traction flow

**Promotion of alternative fuels**

**CO₂ Reduction**
Toward Development of Appealing Products

Revolutionary Package

Low Cost

Fun to Drive

Improve product competitiveness by development of appealing products and cost reduction technology
Partner Robot Development

Promote robot development in four areas that assist people:

1. Housework assistance
2. Personal transfer assistance
3. Manufacturing assistance
4. Nursing care/medical assistance

Intelligence: High level
Kindness: High level

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R&D Global Offices

North America

Southeast Asia

Japan

Europe

Australia

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